

Notice of Allowability

Application No.

09/869,578

Examiner

Rip A. Lee

Applicant(s)

CARNAHAN ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to September 17, 2004.
2. ☒ The allowed claim(s) is/are 1, 2 and 4-20.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1, 2, and 4-20 are allowed over the closest references, WO 98/45337 to Peil *et al.*, U.S. Patent No. 5,783,512 to Jacobsen *et al.*, and U.S. Patent No. 6,271,165 to Jacobsen *et al.*

The present invention is drawn to a process for preparing an olefin polymerization catalyst comprising the steps of (A) calcining silica, (B) reacting calcined silica with an agent to form a support precursor, (C) applying to the support precursor a first solution of metal complex or non-polymeric/non-oligomeric complexes and removing the solvent to form a supported procatalyst, (D) applying to the supported procatalyst a second solution of metal complex or non-polymeric/non-oligomeric complexes (different from that of the previous step) to form a supported catalyst, and (E) removing the solvent to form a recovered supported olefin polymerization catalyst. In step (D), the second solution is provided in such an amount that 100 percent of the pore volume of support precursor is not exceeded.

Use of non-polymeric/non-oligomeric complexes in step (C) precludes use of aluminoxanes as the cocatalyst or activator.

Applicants have discovered unexpectedly that removal of solvent in both steps is critical in providing an active catalyst with acceptable activity (examples 2, 4, and 5). Where these conditions are not satisfied, catalyst activity is poor (examples 1 and 3).

Peil *et al.* teaches a process in which calcined and treated silica is separated into two fractions. One portion is loaded with metallocene and the other is loaded with non-polymeric/non-oligomeric activator. Both samples are dried under vacuum and then combined to form a supported catalyst. The reference is a variant of, and therefore does not teach, the process of the instant claims. Furthermore, there is no teaching of providing the second solution in an amount less than 100 % of the pore volume.

U.S. Patent No. 5,783,512 to Jacobsen *et al.* teaches a process for making catalyst in which a solution of ionizing activator is added to the support in such a manner that the solution volume does not exceed the pore volume of the support. Afterward, the mixture was agitated, resulting in dried powder. Once dry, a solution of transition metal complex is added to provide a supported catalyst. In this case, the support material is dried simply by agitation, but there is no clear indication that all solvent has been removed. The support material may be dry but still contain solvent within. Therefore, the process of the present invention is not taught in the reference.

U.S. Patent No. 6,271,165 to Jacobsen *et al.* teaches a process for making catalyst. A solution of ionic activator is added to calcined and treated silica, and the solvent is removed under vacuum. Subsequently, a solution of transition metal complex is provided, and the solvent is also removed from the final product. The inventors indicate that the solution volume of the *first* solution containing ionic activator is from 20-200 volume percent, and preferably 70-130 volume percent, of the total pore volume. In contrast, the present invention requires that the solution volume of the *second* solution must not exceed 100 % of the total pore volume.

Jacobsen *et al.*:

first solution (ionic activator; less than 100 % pore volume)

second solution (metal complex)

present invention (*i.e.*, examples 2, 4, 5)

first solution (ionic activator)

second solution (metal complex; less than 100 % pore volume)

Therefore, it is maintained that the catalyst of the present claims is not taught by, or made obvious, the teachings of Jacobsen *et al.*

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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September 27, 2004



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